

AMENDMENTS TO THE DRAWINGS

Amendments to the drawings included on the attached replacement sheet 8/8 are as follows:

In Fig. 9E, reference number "934" has been changed to "936".

REMARKS

Applicant is amending Fig. 9E as described above and shown on the attached replacement sheet. The amendment changes a reference number "934" to "936" for consistency with the written description of Fig. 9E in paragraph [0066] of the specification and to avoid a conflict with the use of reference number "934" in Fig. 9D. No new matter is added.

Claims 1-10, 13, and 15-33 were pending in the above-identified application when last examined and are amended as indicated above.

Claims 4-6 and 16 were withdrawn from consideration as being directed to non-elected species or dependent from claims that are directed to a non-elected species. Claims 4, 6, and 16 are canceled. Claim 5, which is directed to the elected species, is amended to depend from claim 1. Applicant believes that claim 1 is generic to the non-elected species illustrated in Fig. 9C and the elected species illustrated in Fig. 9E. In view of the above, amendments, Applicant requests consideration of claim 5.

Claims 1-3, 7-10, 13, 15, 17, 18, 22, 23, and 27-33 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Pat. No. 6,480,012 (Komori). Claims 3, 15, 17, and 22 are canceled. Applicant respectfully traverses the rejection of claims 1, 2, 7-10, 13, 18, 23, and 27-33 as presented above.

Independent claim 1 distinguishes over Komori at least by reciting, "a probe comprising a semiconductor die and probe tips rigidly attached to the semiconductor die ...; a substrate on which the semiconductor die is mounted; a probe card including a receptacle sized to hold the substrate, wherein the substrate is detachably mounted in the receptacle."

Komori discloses probe cards such as illustrated in Fig. 1b of Komori, where "a probe card wafer 1 of the same material as that of a wafer under test 4 is formed opposing wafer under test 4 having a plurality of semiconductor devices." See Komori, column 5, lines 36-39. Probe card wafer 1 makes electrical connections to an insulator board 2 and is held in place against insulator board 2 by suction applied via a through hole 7 in insulator board 2. Komori starting in column 5, lines 45 describes, that "Insulator board 2 is connected to a board interconnection cable 6 extending from board connector 5 electrically connected to a

tester (not shown).”

Komori fails to disclose or suggest a receptacle sized to hold a substrate on which a semiconductor die is mounted. Komori uses suction to hold probe wafer 1 in contact with insulator board 2. To the extent that probe wafer 1 is mounted on insulator board 2, Komori fails to discuss the mounting of insulator board 2. In particular, Komori fails to suggest a receptacle to hold insulator board 2 but instead describes a cable for electrical connections.

In accordance with an aspect of Applicant’s invention, a probe die can be mounted on a substrate that provides a space transformation from the fine pitch associated with probe tips on the die to a larger pitch of a receptacle. This permits use of a receptacle to simplify removal and replacement of the probe die and attached substrate, for example, when the probe die becomes worn or damaged. Komori fails to disclose or suggest such a combination of a receptacle and a substrate for connection of a probe. Independent claim 1 is thus patentable over Komori.

Claims 2, 7-10, and 29-33 depend from claim 1 and are patentable over Komori for at least the same reasons that claim 1 is patentable over Komori.

Claim 5 further distinguishes over Komori by reciting, “the substrate is substantially identical to a substrate used in a flip-chip package for the device.” Komori is directed to wafer level systems that test multiple devices on a wafer under test. (Generally, such wafers must be diced to provide chips for packaging.) Insulator board 2 in Komori is apparently wafer size to hold a probe wafer 1. Komori fails to suggest that insulator board 2 (or similar structures on which probe wafer 1 is mounted) could be used in a flip-chip package.

Independent claim 13 distinguishes over Komori at least by reciting, “forming probe tips on a first surface of a semiconductor die in a pattern matching a pattern of contacts on the semiconductor device ...; forming terminals on a second surface of the semiconductor die in a pattern matching the pattern of the contacts on the semiconductor device; and forming conductive vias through the semiconductor die, wherein the conductive vias electrically connect the probe tips respectively to the terminals.” Komori fails to suggest a structure where probe tips on one side of a die and contacts on the other side of a die match the pattern contacts on a semiconductor device being tested. In accordance with an aspect of Applicant’s invention, using contacts that match the pattern of the devices being tested allows use of flip-chip package components for fan out and electrical connection of a probe die. This can reduce the design time and cost for a probe card. Komori fails to disclose or suggest such a structure. Accordingly, claim 13 is patentable over Komori.

Claims 18, 23, 27, and 28 depend from claim 13 and are patentable over Komori for at least the same reasons that claim 13 is patentable over Komori.

For the above reasons, Applicant requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 102.

Claims 19-21 and 24-26 were rejected under 35 U.S.C. § 103(a) as unpatentable over Komori. Applicant respectfully traverses the rejection.

Claims 19-21 and 24-26 depend from independent claim 13 and are patentable over Komori for at least the same reasons provided above to show that claim 13 is patentable.

For the above reasons, Applicant requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 103.

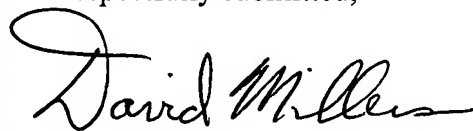
Claims 34 and 35 are added. New claim 34 is directed to the elected species, and new claim 35 is generic to the elected species and one or more non-elected species. Claims 34 and 35 depend from claim 1 and are patentable for at least the same reasons that claim 1 is patentable.

In summary, claims 1-10, 13, and 15-33 were pending in the application. This response amends Fig. 9E, cancels claims 3, 4, 6, 15-17, and 22, amends claims 1, 5, 8, 9, 13, 18, 21, and 23, and adds claims 34 and 35. For the above reasons, Applicant respectfully requests allowance of the application including claims 1, 2, 5, 7-10, 13, 18-21, and 23-35. Please contact the undersigned attorney at (408) 927-6700 if there are any questions concerning the application or this document.

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Respectfully submitted,



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